

## PATENT COOPERATION TREATY

PCT

RECEIVED

04 OCT 2004

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT



PCT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference E-1742/03	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/IT 03/00432	International filing date (day/month/year) 10.07.2003	Priority date (day/month/year) 16.07.2002
International Patent Classification (IPC) or both national classification and IPC F16F15/14		
Applicant DAYCO EUROPE S.R.L. ET AL.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:
- I ☒ Basis of the opinion
  - II ☐ Priority
  - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of invention
  - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI ☐ Certain documents cited
  - VII ☐ Certain defects in the international application
  - VIII ☐ Certain observations on the international application

Date of submission of the demand  13.02.2004	Date of completion of this report  01.10.2004
Name and mailing address of the International preliminary examining authority:   European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer  Beaumont, A  Telephone No. +31 70 340-3603 

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/IT 03/00432**

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

3-9 as originally filed  
1, 2 received on 23.08.2004 with letter of 19.08.2004

**Claims, Numbers**

1, 2 received on 23.08.2004 with letter of 19.08.2004

**Drawings, Sheets**

1/1 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/IT 03/00432**

---

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	1,2
	No: Claims	
Inventive step (IS)	Yes: Claims	1,2
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1,2
	No: Claims	

2. Citations and explanations

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Reference is made to the following document:

D1: US-A-5 637 041 (HAMAEKERS ARNO ET AL) 10 June 1997 (1997-06-10)

- 2.1 The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document):

an integrated pulley-torsional damper assembly including a hub designed for being rigidly connected to a drive member, a pulley (6) connected to the hub by means of a first elastomeric ring (7) having the function of a filter for torsional oscillations, an inertia ring (3) connected to the hub by means of a second elastomeric ring (5) defining with the inertia ring (3) a damping system, said hub comprising an internal annular flange (2) designed for connection to said drive member, said hub comprising, integrally with said internal annular flange (2), an annular coupling portion having a substantially C shaped cross section, which is open axially on the side where said internal annular flange (2) is located and forms a cavity, said coupling portion comprising an outer tubular wall (10), on which said second elastomeric ring (5) is fitted, a bearing (8,12) being set between said outer tubular wall (10) and said pulley (6) for radial and axial support of said pulley (6) with respect to said hub, said pulley (6) comprising a peripheral crown and a flange extending radially inwards from said peripheral crown, said flange comprising an outer annular portion, an intermediate tubular wall coaxial with respect to said crown and internal thereto.

The subject-matter of claim 1 differs from this known D1 in that the assembly comprises a coupling flange provided with an inner annular wall bearing axially against said flange of said hub and with a peripheral annular edge, and in that said flange of said pulley includes an inner annular flange extending from an axial end of the tubular wall opposite to the outer annular portion, said first elastomeric ring being set axially between said inner annular flange of said pulley and said peripheral annular edge of said coupling flange, and forming a single body with them; said inertia ring being contained inside said crown of said pulley, said first elastomeric ring being housed within said cavity of said annular coupling portion.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

- 2.2 The problem to be solved by the present invention may be regarded as reducing the unit dimensions while maintaining a low number of components.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) as no document discloses all the features of the characterising part of claim 1 and it would then not be possible for the skilled man to arrive to the assembly of claim 1.

3. Claim 2 is dependent on claim 1 and as such also meets the requirements of the PCT with respect to novelty and inventive step.

## CLAIMS

1. An integrated pulley-torsional damper assembly including a hub (2) designed for being rigidly connected to a drive member (3), a pulley (4) connected to the hub (2) by means of a first elastomeric ring (5) having the function of a filter for torsional oscillations, an inertia ring (6) connected to the hub (2) by means of a second elastomeric ring (7) defining with the inertia ring (6) a damping system, said hub (2) comprising an internal annular flange (10) designed for connection to said drive member (3), said hub (2) comprising, integrally with said internal annular flange (10), an annular coupling portion (14) having a substantially C-shaped cross section, which is open axially on the side where said internal annular flange (10) is located and forms a cavity (9), said coupling portion (14) comprising an outer tubular wall (12), on which said second elastomeric ring (7) is fitted, a bearing (34) being set between said outer tubular wall (12) and said pulley (4) for radial and axial support of said pulley (4) with respect to said hub (2), said pulley (4) comprising a peripheral crown (15) and a flange (17) extending radially inwards from said peripheral crown (15), said flange (17) comprising an outer annular portion (19), an intermediate tubular wall (20) coaxial

with respect to said crown (15) and internal thereto, characterized by comprising a coupling flange (25) provided with an inner annular wall (26) bearing axially against said flange (10) of said hub (2) and with a  
5 peripheral annular edge (27), and in that said flange (17) of said pulley (4) includes an inner annular flange (21) extending from an axial end of the tubular wall (20) opposite to the outer annular portion (19), said first elastomeric ring (5) being set axially between  
10 said inner annular flange (21) of said pulley (4) and said peripheral annular edge (27) of said coupling flange (25), and forming a single body with them; said inertia ring (6) being contained inside said crown (15) of said pulley (4), said first elastomeric ring (5)  
15 being housed within said cavity (9) of said annular coupling portion (14).

2. The assembly according to Claim 1, characterized in that said bearing (34) comprises integrally a tubular portion (35), radially set between said outer tubular  
20 wall (12) of said hub (2) and said intermediate tubular wall (20) of said pulley (4), and a flange (36) axially set between said outer annular portion (19) of said flange (17) of said pulley (4) and said outer tubular wall (12) of said hub (2).

# AN INTEGRATED PULLEY-TORSIONAL DAMPER ASSEMBLY

## TECHNICAL FIELD

5       The present invention relates to an integrated pulley-torsional damper assembly.

## BACKGROUND ART

Integrated pulley-torsional damper assemblies are known, which comprise a hub designed for being rigidly  
10 connected to a drive member, for example the drive shaft of an internal-combustion engine, a pulley connected to the hub by means of a first ring made of elastomeric material having the function of filter for torsional oscillations, and a inertia ring, connected to the hub  
15 by means of a second ring made of elastomeric material, which defines with the inertia ring a damping system.

Integrated assemblies of the type described briefly above are used, for instance, in the automotive sector and are connected, at one end of the drive shaft of an  
20 internal-combustion engine, to enable driving, by means of a belt transmission, of auxiliary members of the engine, for example, an alternator, a fan and/or a compressor, and enable, at the same time, damping of the torsional oscillations of the drive shaft.

25       US-A-5 637 041 discloses an integrated pulley-torsional damper assembly having the features of the



preamble of claim 1.

DISCLOSURE OF INVENTION

The purpose of the present invention is to provide  
an integrated pulley-damper assembly of an improved  
5 type, which has a particularly small number of  
components and presents contained axial dimensions.

The aforesaid purpose is achieved by an integrated  
pulley-torsional damper assembly as claimed in claim 1.

BRIEF DESCRIPTION OF THE DRAWING

10 For a better understanding of the present